tions was rapidly increased; in 1871 there were fifty-five, in 1898 eighty. The collection of rainfall statistics also interested Prof. Mohn greatly, and by 1890 he had established nearly 100 stations, in 1895 the number reached about 300, and a few years later 500 stations reported rainfall to the institute.

The international exchange of telegrams was also developed. As early as 1869 telegrams were received from Great Britain; Denmark commenced in 1871, Sweden in 1873; Russia, Finland, Germany, and France began in 1892, and the Faröe Islands in 1907; Spitsbergen, Austria-Hungary, and Italy joined in 1912, followed in 1913 by Holland, Spain, Portugal, and Madeira.

Meanwhile the telegraphic reporting of observations from Norwegian stations was increased; by 1892 thirty-three stations reported by telegraph, while by 1914 the number had increased to sixty-nine.

Services of storm-warnings and forecasts were commenced early in the history of the institute. The reports and publications were organised and developed, and the volume gives diagrammatic representations of the growth of the institute's reporting stations, staff, budget, and library.

Aerology received much attention at the beginning of the present century; sounding balloons were sent up, and in 1909 pilot-balloon ascents were begun. In 1912 this part of the work was taken over by Prof. V. Bjerknes, and it is now carried on by the observatory at Aas.

Notes are given on the past and present members of the staff of the institute, and detailed descriptions of the growth and work of each of the three sections dealing with climatology, forecasting, and rainfall respectively. The establishment and work of the observatories at Aas, Bergen, and Haldde are described, and the book is illustrated by interesting photographs of the institute and observatories, and by reproductions of charts and diagrams.

NOTES.

THE letters that have appeared recently in the *Times* and in articles elsewhere on the effect of electric action on the growth of plants show a readiness to believe that almost any wonders may be wrought by electricity. Most scientific workers will agree with Prof. Armstrong and Sir James Crichton-Browne in their scepticism as to the proved value of electrical treatment as a general method of increasing crop production. It is asserted that by the electrical treatment of seeds increases of yield of 20 to 80 per cent. may be produced. The statement seems to refer to a commercial process in which, apparently, seeds are subjected to the combined action of electric currents and certain solutions; in the method electrolysis appears to play some part. The process seems based on the treatment known to physicians as "ionic medication," and used, for example, for the reduction of swollen joints. Treatment of seeds in this way appears to have no sound physiological basis, and no data derived from experiments carried out under critical conditions appear to be available, so that it is impossible to evaluate the method. No one who knows the difficulty of carrying out satisfactory agricultural experiments, and the ease with which a few favourable but illusory results can be obtained, is likely to accept the views of a few farmers as convincing evidence of the value of the process. The method of treatment of the growing plant with a high-tension discharge from overhead wires has been before the public for some years; it is certainly more promising, but it is generally admitted to be in a purely experimental stage.

SIR J. J. DOBBIE, Government Chemist, and principal of the Government laboratories, has been elected a member of the Athenæum Club under the rule of the club which empowers the annual election by the committee of a certain number of persons of distinguished eminence in science, literature, the arts, or for public service.

SUMMER-TIME began in France and Italy on March 10; it begins with us on March 24, and will begin in Holland on April 1. The dates on which summer-time ends are also different in different countries. However much "daylight saving" by alteration of clocks may be appreciated by the public, there can be no doubt that the varying dates adopted for the beginning and ending of the change of standard are most confusing, and will render it very difficult to determine the exact instant at which any records of observations of natural occurrences are made.

THE issue of the *Comptes rendus* of the Paris Academy of Sciences for January 28 contains a decree of the President of the Republic creating a new division under the title "Application de la Science a l'Industrie," which is to consist of six members, who are to enjoy the same privileges as the "Académiciens libres," without restriction as to residence. There is probably no more conservative scientific organisation in the world than the Académie des Sciences, and there could be no more significant sign of the changed conditions of the times than this action on the part of the French Government and the academy in thus seeking to bring science and industry into closer relationship.

IN connection with our note on the Air Force Medical Service in last week's issue, we may direct attention to the appointment of a Medical Administrative Committee. According to the *Lancet*, the Director-General of the Naval Medical Service is chairman. The other members are the Director-General of the Army Medical Service, Fleet-Surgeon R. C. Munday, Major C. B. Heald, Surgeon-General Rolleston, Dr. Henry Head, Mr. Raymond Johnson, Dr. Leonard Hill, and Sir Walter Fletcher. We observe with satisfaction that the scientific aspects of the problems will be likely to receive consideration. At the same time, the physiological representatives are small in number compared with the official and medical members, a fact to be regretted in view of the nature of the chief questions with which the Committee will have to deal. These questions require a wide knowledge of a great variety of physiological problems.

As the outcome of a conference held on November 7 last, at which there were present representatives of the Committee of the Privy Council for Scientific and Industrial Research and of the Department for the Development of Mineral Resources, besides many of the land- and mine-owners of Cornwall, a fund for research has been raised, and a Research Board has been appointed by the Committee of the Privy Council. The members of the Board are:—Sir Lionel Phillips, Bt. (chairman); Mr. J. G. Gilbert, Cornish Chamber of Mines; Sir Frank Heath, Department of Scientific and Industrial Research; Sir T. K. Rose, chairman of the Research Committee of the Board; Mr. Edgar Taylor, Institution of Mining and Metallurgy; Mr. R. Arthur Thomas, Cornish Chamber of Mines; and Sir Richard Threlfall, Advisory Council for Scientific and Industrial Research; with Mr. A. Richardson as secretary (15 Great George Street, Westminster, S.W.1). The Board, after consultation with its Research Committee, has authorised extended lines of research with the view of increasing the recovery of metal in the treatment of ores.

IN his lecture on "Chemical Research in Relation to Industry" (Adelaide: G. Hassell and Son) Dr. Hargreaves says little that is new and nothing that is not true. The arguments he uses apply equally to us here and to our colleagues in the Antipodes. Dr. Hargreaves is Director of the Department of Chemistry of South Australia, which Department he describes as a connecting link between the industries and the pure man of science, and his lecture deals with two main topics: first, the need for closer co-operation between scientific men and business men; secondly, the need for paying chemists an adequate salary in order to get the right men. We are, in this country, face to face with the same two questions, and there is a grave risk that Great Britain as a whole will not realise their importance. There are indications that the scientific world here is now convinced on both these points, but the majority of business men keep aloof from science, and have been of late too busy with their own difficult problems to apply their minds to an investigation of matters outside their usual routine. Dr. Hargreaves's lecture is temperately written and contains some useful suggestions. It is to be hoped that a real effort will be made to interest the commercial men in this country in these problems of pressing and national importance, but present conditions make it difficult to start a crusade of the necessary dimensions.

MR. W. J. UGLOW WOOLCOCK, the registrar and secretary of the Pharmaceutical Society, has been appointed secretary of the Association of British Chemical Manufacturers.

MR. F. W. HODGE, head of the Bureau of American Ethnology of the Smithsonian Institution since 1905, has resigned, and has been succeeded by Dr. J. W. Fewkes, who has been on the Bureau's staff since 1895.

WE notice with regret the announcement of the death of Prof. E. W. Davis, dean of the College of Arts and Sciences and head of the Department of Mathematics of the University of Nebraska, at the age of sixty years.

THE death is announced, at the age of seventy-three years, at Dorchester, Mass., of Mr. Paul S. Yendell, known particularly by his studies of the light-curves and periods of variable stars of the Algol and short-period types.

WE learn from *Science* that Prof. Rollin D. Salisbury, head of the Department of Geography and dean of the Ogden Graduate School of Science at the University of Chicago, has been awarded the Helen Culver gold medal of the Geographic Society of Chicago. Prof. Salisbury was the first president of the society twenty years ago.

THE meeting of the Institution of Electrical Engineers on April 11 will be held at King's College, Strand, W.C.2, at 6 p.m., and will be a joint meeting with the electrical section of the Royal Society of Medicine. Papers will be read on the subject of "Medical Electricity," and there will be an exhibition of apparatus.

THE Röntgen Society has recently founded an annual lecture in memory of its first president, the late Prof. Silvanus P. Thompson. The first "Silvanus Thompson Memorial Lecture" will be delivered by Sir Ernest Rutherford at the next meeting of the society, to be held on Tuesday, April 9, at 8 p.m. The council will be pleased to welcome all interested, and applications for cards of admission should be made to the hon. secretary of the society, Dr. S. Russ, Middlesex Hospital, London, W.1. Further particulars will be announced in due course.

THE sudden death, on January 20 last, in his fifty-fifth year, of Dr. Rollin A. Harris, of the U.S. Coast and Geodetic Survey, is announced in *Science*. Dr. Harris entered the Tidal Division of the U.S. Coast and Geodetic Survey in 1890, and his "Manual of Tides" appeared in six parts between 1884 and 1907. In 1911 a monograph by him on "Arctic Tides" was published by the Survey. In addition, Dr. Harris was the author of numerous papers on the theory of functions with applications to physics, geodesy, and cartography.

WE much regret to learn of the death of Dr. Lewis Moysey, who was lost by the torpedoing of the hospital ship *Glenart Castle* on February 26. Dr. Moysey had only just joined the ship as one of its medical officers, and he was not among the survivors. Dr. Moysey, previous to the war, had long been in practice as a medical man at Nottingham. He was a very keen palæontologist, greatly interested in the rarer fossils of the coalfield around his home, and to the collection of such specimens in the field he had for many years devoted the scanty leisure of a busy professional life. He thus acquired an exceptionally fine series both of plant and animal remains, some of which he described in a number of papers, especially before the British Association, and others he placed in the hands of friends who were specialists in these departments. Only a few weeks before his death he handed over as gifts his entire collections, the plant remains to the University of Cambridge, and the animal fossils to the Geological Survey. Dr. Moysey possessed great charm of manner, and his loss will be much deplored among those interested in the palæontology of the older rocks.

WE regretfully record the death on February 6 of Capt. S. Gordon McDakin (retired), formerly of the Black Watch, but long resident in Dover, and there taking a leading interest in scientific affairs. During many years he presided over meetings of the Dover Sciences Society. His latest paper, on "Some Remarkable Mountains," was published in 1909 by the East Kent Scientific Society, which he also addressed on "Coast Erosion" and on "Fissure Flows of Lava." The former subject he brought before his home society, coupled with that of "Sea Temperature," and later on addressed it on the topic of "Shingle and Conglomerates in Reference to Local Deposits." That he was a trustworthy botanist is indicated by his papers on "Verification of Records of Flora" and "Verification of Botanical Records," the latter in partnership with the Rev. J. Taylor. At the initial constituent meeting of the South-Eastern Union of Scientific Societies in 1896 Capt. McDakin was one of the Dover delegates. His cheerful presence became welcome at every congress, generally in company with his wife, who encouraged him in his favourite pursuits. Science is apt sometimes to groan a little under its own weight of production. Capt. McDakin was therefore a useful type of man, content to inspire in his neighbours appreciation of scientific work, without appealing to the Press for any solid monument to himself.

AN Entomological Society of Spain has lately been founded, with its centre for the present at St. Saviour's College, Saragossa. Dr. Hermenegildo Gorría, of

Barcelona, is the president for 1918, and the Rev. R. P. Longinos Navás, S.J., the secretary. The society will deal with insects and the other arthropods usually studied with them from every point of view, both purely scientific and economic. Except from July to September, it will hold a monthly meeting for the reading and discussion of papers, and each meeting will be followed by the issue of a small *Boletin*. We have just received the first part of this publication (Nos. 1 and 2, January, 1918), which contains the rules of the society, the first list of members, and a portrait of the president. Following this preliminary matter there is the first instalment of a catalogue of the Coleoptera of Spain, by the Rev. José María de la Fuente. We congratulate our Spanish colleagues on the marked increase of activity in the pursuit of natural science in their country during recent years, and add our best wishes for the success of the important new society.

A COPY of the annual report for the year 1917 of the Philosophical Institute of Canterbury, New Zealand, has been received. During the year the presidential address on some questions of efficiency was given by Mr. L. Birks, and the following lectures were delivered:—Prof. H. B. Kirk, "The Fly Nuisance and its Control"; Prof. J. Hight, "Science and Economics"; and Prof. W. P. Evans, "Some Poison Gases." In April, by request of the local Commissioner of the National Efficiency Board, members of the council of the institute waited on him and discussed matters relative to national efficiency. Another question which has engaged the attention of the council is the proposal made by the "Scientific and Industrial Research Committee" of the New Zealand Institute to recommend the establishment of a national "Board of Science and Industry." The council criticised some features of the scheme, and trusts that the proposal will materialise, and that an institution of great national value will result. The sum of 110*l.* allotted by the New Zealand Institute to members of the Philosophical Institute was received. Considerable progress has been made in the investigation of the phosphate rocks of Canterbury by Messrs. R. Speight and L. J. Wild. Certain preliminary work has been done on the other investigations, viz. "The Deterioration of Apples in Cold Storage" and "The Electrical Prevention of Frosting in Orchards."

"AT a certain stage of social evolution," says Sir James Frazer in his article entitled "The Killing of the Khazar Kings," in the December (1917) issue of *Folklore*, "not a few races appear to have been in the habit of putting their kings to death, either at the end of a fixed term, or on the failure of the king's health and strength, or simply whenever a great public calamity, such as drought or famine, had befallen the country." Among tribes which have practised this remarkable form of limited monarchy must now be included the Khazars, or Khozars. For some 900 years this now almost forgotten tribe, from their home in the spurs of the Caucasus and along the western shore of the Caspian—called after them the Sea of the Khazars—played a great part in history on the European-Asian borderland. It is certainly remarkable that a people which had reached such a high level of civilisation and culture should have practised legalised regicide. But the evidence collected by Sir James Frazer from a very wide survey of medieval literature leaves no doubt on the matter. This survey of an almost unknown tribe is a contribution to anthropology of permanent value.

IN the *American Museum Journal* for December last Mr. Roy C. Andrews gives an admirable summary of the results of his expedition to Yunnan on behalf of the American Museum of Natural History. Herein he gives a valuable account of the habits of the goral and serow, of which but very little is known. These animals are rare in museum collections, so that he is not unnaturally proud of the fact that he has secured for his museum thirty-two gorals of at least two species, and seven serows of three species, forming a series the like of which is to be found in no other museum in the world. A large series of a shrew-like animal, of the genus Hylomys, extremely rare in collections, constituted the most striking of the additions to the smaller mammals made by the expedition. A number of remarkably fine photographs add immensely to the value of this contribution.

THE insect pest known as *Icerya purchasi,* originally a native of Australia, according to a report reprinted in the *Pioneer Mail* for November 24 from the *Agricultural Journal of India,* has now acquired a firm footing in Ceylon. It is especially destructive to citrus trees, but it may be found on other trees and plants, including the pomegranate, grape, rose, castor, mulberry, apple, peach, apricot, fig, walnut, willow, pepper, and potato. The adult female is about one-fifth of an inch in length and rather less in breadth, and is of a brown, reddish, or blackish colour, the body being overlaid by a large, white-fluted, cottony mass, in which the eggs are laid. In view of the great damage done to orange-groves in the United States, the Government sent a man of science to Australia, and the result was that a number of small red and black ladybird beetles (*Novius cardinalis*) were carried to California, where they speedily multiplied and dealt effectively with the Icerya. The Government of India is now undertaking inquiries to prevent the entry of the pest into that country.

OF the great memoir on 'Hawaiian and Other Pacific Echini," begun in 1907 by Alexander Agassiz and H. Lyman Clark, three parts were published by the joint authors, and, with a fourth part by Dr. Clark, composed vol. xxxiv. of the Memoirs of the Museum of Comparative Zoology. Two further parts by Dr. Clark have now completed the work (Memoirs, vol. xlvi., Nos. 1 and 2). Of these, the former deals with the suborder Clypeastrina, or shield-urchins, and the systematic descriptions are preceded by a general discussion. Dr. R. T. Jackson has given reasons for the belief that the clypeastroids were derived from a group of regular urchins of which the Arbaciidæ are modern representatives. Dr. Clark, however, points out that, in the perforation of their tubercles and the structure of their pedicellariæ, they more closely resemble the Saleniidæ. The final part of the memoir consists of 200 pages and eighteen plates devoted to that large assemblage of much-modified urchins known as Spatangina, or heart-urchins. This is believed to include forms derived from at least two, and possibly four, distinct stocks. Dr. Clark does not, however, attempt to represent this in his classification. There is a discussion of the various structures used in classification, such as pedicellariæ and fascioles, but as regards the latter Dr. Clark does not make use of the important study published by B. Hoffmann in the *Palaeontologische Zeitschrift,* 1914. The present memoir adds one more to the valuable and admirably produced zoological publications arising out of the cruises of the U.S. Fish Commission steamer *Albatross,* and Dr. Lyman Clark is to be thanked and congratulated on completing his important share of the work.

A REPORT on the work of the Imperial Institute for South Africa, presented to the Committee for the Union of South Africa and Rhodesia at its last meeting, includes an interesting reference to the possible utilisation of the waste bark of the wattle-tree, which is extensively cultivated in South and East Africa. The waste, from which the tanning constituent has been removed, can be utilised both here and in Natal, where tanning extract is at present being produced, for the manufacture of an excellent brown paper or millboard. The waste from tanyards in this country may thus be a source of remuneration, and in South Africa an important industry may be created where brown paper and millboard for packing purposes, especially for fresh fruit transport, are in great demand, and have to be imported for the purpose. The wood of the Acacia trees from which the bark has been taken can also be utilised for millboard. According to the report, arrangements are already being made for the use of spent wattle bark in this country by paper manufacturers.

A PAPER entitled "British Trade and the Metric System" was read by Mr. E. A. W. Phillips at a recent meeting of the Concrete Institute. Mr. Phillips proposes a system of weights and measures including, in addition to the more usual English denominations, a decimal scale based on a "British metre" of 39·6 in., the ton of 2240 lb., divided into ten sacks, or 1000 "British kilograms," and a cubic British metre of pure water divided into 1000 litres. It is mentioned that the proposed metre is the same length as the ancient Belgic yard, which the author calls the "Anglo-Saxon metre," and he states that this has existed in Britain since the third century at least. Five of these yards made the rod, pole, or perch used in land measure. Mr. Phillips raises the question of the possibility of making his proposed decimal system the international standard for trade, commerce, and engineering, and of restricting the metric system proper to purposes of pure science. As regards coinage, his proposals include the retention of the pound sterling of ten florins and the division of the florin into 100 imaginary cents of account, not coined, for use in decimal accounting and decimal quoting.

A RECENT Technologic Paper (No. 103) of the U.S. Bureau of Standards deals with some typical cases of selective corrosion of 60 : 40 brass, or Muntz metal. The specimens described by the author, Mr. H. S. Rawdon, include bolts, sheathing, and condenser tubes. In all the cases examined, the selective corrosion takes the form of a removal of zinc from the β crystals, the α constituent not being attacked until a later stage. The corroded mass retains its external form, but consists only of spongy copper. A sharply defined boundary between the corroded portion and unaltered brass is always present, without any intervening zone of lower zinc content. Chemical action advances in the first instance along the boundaries of the crystal grains, and in the β crystals also along systems of intersecting planes, which may be twinning planes. Contact with a more strongly electro-negative metal has an accelerating influence, but none of the actual cases observed can be attributed to this cause. Experiments with grooved bars under tensile stress show that local increase of stress favours corrosion. Annealing has little effect. The results on the whole confirm those obtained by previous workers, but the photomicrographs illustrate very clearly the successive stages in the removal of zinc from alloys of this class.

THERE has been such a vast increase in the manufacture of organic nitro-compounds for the production of both dyes and explosives since the outbreak of war that the vexed question of the estimation of nitrogen therein has probably become acute. To the Journal of the Society of Chemical Industry of August 31 last Mr. A. P. Sachs contributes an account of what seems to be a highly successful method of effecting this estimation. The method depending on the reduction of the nitro-group with stannous chloride solution in an open flask and estimation of the excess of reducing agent with iodine was found to be unsatisfactory in the case of nitrated "solvent naphthas." The author finds, however, that if the nitro-compound is heated in a sealed tube with excess of stannous chloride solution (prepared by dissolving the dihydrated salt in twice its weight of 25 per cent. hydrochloric acid) at 120° for two hours, the tube being shaken every fifteen minutes, reduction is complete. The excess of stannous chloride is then determined by titration with decinormal iodine solution, using starch as indicator. It is of importance that exactly the same volume of stannous chloride solution should be used in all experiments and for the blank determination. Quoted analyses made by this method and by the combustion method on the same substances gave very concordant results.

AMONG forthcoming books of science we notice the following:—"The Future of Our Agriculture," H. W. Wolff (*P. S. King and Son, Ltd.*); "Dragons and Rain Gods, etc.," Prof. G. Elliot Smith (*Manchester University Press*); "Bibliography of the Geology and Eruptive Phenomena of the more Important Volcanoes of Southern Italy," the late Dr. H. J. Johnston-Lavis; "An Economic Geography of the British Empire," C. B. Thurston; "The New Regional Geographies, vol. iii., Europe and Africa," L. Brooks, and a new edition of "The Application of Hyperbolic Functions to Electrical Engineering Problems," A. E. Kennelly (*University of London Press, Ltd.*); "Problems of Reconstruction," papers read at the summer meeting held at the Hampstead Garden Suburb, August 3–17, 1917, with an introduction by the Marquess of Crewe; "Forestry Work," W. H. Whellans (*T. Fisher Unwin, Ltd.*); "The Year Book of Wireless Telegraphy and Telephony, including Map of the World showing Wireless Telegraph Stations, 1918" (*The Wireless Press, Ltd.*).

OUR ASTRONOMICAL COLUMN.

THE NEW WOLF PLANET.—An orbit of this body (which has been designated DB) has now been computed by Mr. G. Stracke, and its accuracy is confirmed by a recent Greenwich photograph:—

Perihelion passage 1918 January 3·617, G.M.T.

$$\left.\begin{array}{lrrr}\omega & 347^{\circ} & 46' & 15''\\ \text{☊} & 110 & 54 & 1\\ i & 8 & 57 & 41\end{array}\right\}1918{\cdot}0$$

$$\begin{array}{lrrr}\phi & 32 & 12 & 5\end{array}$$

Period 4·025 years
Perihelion distance 1·182
Aphelion „ 3·879

The perihelion distance is very little greater than that of Eros, but the period and eccentricity are much larger. In some revolutions the planet will suffer considerable perturbations by Jupiter, but there will be no near approach in the coming revolution. The fact that the period is very close to four years implies that there will be another near approach to the earth at the next return, of which possibly advantage might be taken to make a determination of the solar parallax. The planet, however, is a little too faint for this purpose, being only of the tenth magnitude in the most favourable circumstances. Its diameter can scarcely be more than four miles.

The orbit is of much the same type as that of Albert, discovered in 1911, but never seen since that year. The present body has been much better observed than